

LETTERS

BARRED OWL NEST IN A NATURAL HOLE IN AN EARTHEN BANK IN EASTERN TEXAS

The barred owl (*Strix varia*) typically nests in old stick nests constructed by hawks, crows, or squirrels, but also in tree cavities (A.C. Bent 1938, Life histories of North American birds of prey, Part II, U.S. Natl. Mus., Washington, DC U.S.A.; P.A. Johnsgard 1988, North American owls, Smithsonian Inst. Press, Washington DC U.S.A.). A few records of nesting sites used by this owl depart from the usual. For example, there is an account of a nest on the ground in a small hollow dug by a barred owl (H. Mikkola 1973, page 125 in J.A. Burton [ED.], Owls of the world, Peter Lowe Publ. Co., London, U.K.). Gibbs (1988, *Oriole* 53:11) described a nest under a bridge in South Carolina, and Peterson (1988, pages 206–207 in R.F. Andrle and J.R. Carroll [EDS.], Barred owl, *Strix varia*, The atlas of breeding birds in New York state, Cornell Univ. Press, Ithaca NY U.S.A.) noted that this owl will nest in barns. Johnson and Follen (1984, *Raptor Res.* 18:34–35) reported barred owls nesting in boxes constructed for them in Minnesota. However, we found no records of this species nesting in a hole in an earthen bank or cliff.

While walking down Crawford Creek near Appleby, Texas, during the last week of March 1990, FE saw an unidentified owl fly from a hole in the side of a steep bank on two occasions. The forested area below the bank was a typical hardwood creek bottom with many mature trees, mostly oaks (*Quercus* spp.) and sweetgum (*Liquidambar styraciflua*), while the area above the bank was mostly loblolly pine (*Pinus taeda*) forest. Suspecting the possibility of a nest, FE rappelled down the sheer vertical face of this 20 m bank and discovered nestling owls in the back of the hole. The circular entrance to the hole was about 10 m above the creek bed, measured about 1 m in diameter, and extended horizontally into the bank for about 1 m. Later that week, CS and C.D. Fisher visited the site to identify the species of owl nesting in the bank. Two 10-d-old nestlings were identified by CS as barred owls.

The hole was an arroyo pipe (Bloom, 1991, Geomorphology, Prentice Hall, Englewood Cliffs, NJ U.S.A.). These natural pipes are fairly common in the Carrizo sandstones of eastern Texas (R.L. Nielson pers. comm.), and are formed by the action of water seeping vertically down the sand layers within the hill until it hits an impermeable layer of clay. The water then flows horizontally along this layer of clay until it eventually exits the hill producing an arroyo pipe. Through time, the hole becomes larger with the action of flowing water.

We visited the nest hole about 1 wk later after heavy rains in the area to find that the nestlings were not present in the hole. We suspected that the rainwater washed away the entire contents of the nest since the pipe appeared smoother, cleaner, and a little larger. If these arroyo pipes are used by nesting barred owls, a relatively flood-free period of about 6 wk must occur for the nesting attempt to be a success.

We appreciate the information provided on arroyo pipes by R.L. Nielson and we thank D.C. Rudolph and D. Saenz for constructive comments on an earlier draft of this letter.—**Clifford E. Shackelford, Wildlife Habitat and Silviculture Laboratory, Southern Research Station, USDA Forest Service, Nacogdoches, TX 75962 U.S.A.; Frederick C. Earley, Law Environmental, Inc., Houston, TX 77040 U.S.A.**

UNUSUAL INTERACTION BETWEEN WOLF AND SHORT-TOED EAGLE

A pair of wolves (*Canis lupus*) with six pups was observed in the Great Indian Bustard Sanctuary, Nannaj (71°41'N, 75°56'E; altitude 486 m) in Solapur District of Maharashtra State, India. On 16 February 1994 at 0730 H the pair brought a road-killed female blackbuck (*Antelope cervicapra*) near their den where they were joined by three of the pups. The blackbuck was fully grown with a mass of about 30 kg. At 0800 H an adult short-toed eagle (*Circaetus gallicus*) soared above them and then perched on top of a tree close to the carcass. The eagle swooped at the wolves five times either attempting to reach the kill or to attack the pups which were about 5 kg in mass.

During each swoop the adult male wolf jumped up at the eagle. On the fifth sortie the eagle swooped much lower and was caught and killed by the wolf, but was not eaten. The male wolf resumed feeding on the blackbuck carcass and the pack abandoned the carcass around 1000 H, ignoring the dead eagle.

Interactions between raptors and wolves have been rarely reported (L.D. Mech 1970, *The wolf. The ecology and behavior of an endangered species*. Doubleday, New York, NY U.S.A.). Several reports involve interactions between wolves and common ravens (*Corvus corax*) since they often feed on the same carcasses (R.O. Peterson 1977, *Wolf ecology and prey relationships on Isle Royale*. U.S. Natl. Park Serv. Sci. Monogr. Ser. No. 11.). Ravens irritate wolves by swooping low over their heads and landing nearby (L. Crisler 1958, *Arctic wildlife*. Harper and Row, New York, NY U.S.A.; L.D. Mech 1966, *The wolves of Isle Royale*. U.S. Natl. Park Serv. Ser. No. 7). Wolves, in turn, leap at ravens in the air, stalk them on the ground, and scatter them from kills. I have also seen wolves chase crows (*Corvus* spp.) from their kills in a similar way. During Isle Royale wolf studies, a wolf was observed catching and killing a raven (Peterson 1977). The wolves played with the carcass of the raven for 15 min and did not eat it.

This is the first record that I am aware of of a short-toed eagle trying to scavenge a predator's kill or attack its young. This eagle is not reported to be a scavenger in the existing literature. The short-toed eagle is reported to feed mainly on snakes, and secondarily on lizards, amphibia, mice, and other mammals (to hare size), and birds as large as guineafowl (S. Ali and S.D. Ripley 1987, *Handbook of the birds of India and Pakistan*, Oxford Univ. Press, Bombay, India; T.J. Roberts 1991, *The birds of Pakistan*. Vol. 1, Oxford Univ. Press, Karachi, Pakistan).

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THE USE OF A ROCK BY AN OSPREY IN AN AGONISTIC ENCOUNTER

Whereas many birds manipulate material to build nests, and some use tools to procure food (H.B. Lovell 1958, *Wilson Bull.* 70:280–281; G.C. Millikan and R.I. Bowman 1967, *Living Bird* 6:23–41; J. Boswell 1977, *Avic. Mag.* 83:88–97), it is unusual to observe a bird using an object in an aggressive encounter. I report the use of a rock in an agonistic encounter by a male osprey (*Pandion haliaetus*).

I observed the rock-dropping incident close to an active osprey nest in Stonington, Connecticut on 8 July 1989. The nest was located in a salt-water marsh to the west of Wilcox Point and adjacent to Long Island Sound and Quiamabaug Cove. A railroad track passed within approximately 100 m of the nest and a series of utility poles ran along the side of the railroad bed. I observed the nest from 1310–1710 H on 8 July 1989 with a 15–45× telescope and 9 × 35 binoculars (see J.P. Roche 1995, *Conn. Warbler* 15:74–77). I was approximately 200 m from the nest and 100 m from the site where the tool was used.

At 1438 H the female osprey began giving alarm calls (A.F. Poole 1989, *Ospreys*, Cambridge Univ. Press, Cambridge, U.K.) from the nest as one male osprey flew into the nest area, followed shortly by three more males. The second male to enter the area (osprey A) was carrying a partly-eaten alewife (*Alosa pseudoharengus*). During the next 22 min, the number of males in the nest area fluctuated between two and four; throughout this period these males behaved aggressively toward each other.

At 1456 H osprey A flew to a pole along the railroad bed and perched. Next, another male (osprey B) flew to the ground, picked up a small rock in its talons from the railroad bed, flew approximately 1 m above osprey A, and dropped the rock on osprey A. Osprey A, which appeared startled but unhurt, flew down to the ground immediately. Osprey A then flew to another pole and perched. Osprey B flew at osprey A again and displaced it from the pole. Osprey A then flew inland, away from the nest area. Osprey A returned at 1459 H to perch again at the side of the railroad bed, but left the area within 2 min. It still had the alewife in its talons when it left.

By 1502 H the female on the nest had stopped calling and osprey B was the only male that remained in the area.